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Group and phase velocities from deterministic and ambient sources measured during the AlpArray-EASI experiment

Petr Kolínský (1), Dimitri Zigone (1,2), Florian Fuchs (1), Irene Bianchi (1), Ehsan Qorbani (1), Maria-Theresia Apoloner (1), Götz Bokelmann (1), and AlpArray-EASI Working Group (3)

(1) Department of Meteorology and Geophysics, University of Vienna, Austria, (2) Institut de Physique du Globe de Strasbourg, Universite de Strasbourg, EOST, CNRS, Strasbourg, France, (3) www.alparray.ethz.ch

The Eastern Alpine Seismic Investigation (EASI) was a complementary experiment to the AlpArray project. EASI was composed of 55 broadband seismic stations deployed in a winding swath of 540 km length along longitude 13.35^0 E from the Czech-German border to the Adriatic Sea. Average north-south inter-station distance was 10 km, the distance of each station to either side of the central line was 6 km. Such a dense linear network allows for surface wave dispersion measurements by both deterministic and ambient noise sources along the same paths. During the experiment (July 2014 – August 2015), three earthquakes M_L = 2.6, 2.9 and 4.2 occurred in Austria and Northern Italy only several kilometers off the swath. We measure Rayleigh and Love wave group velocities between the source and a single station for the recorded earthquakes, as well as phase velocities between selected pairs of stations using the standard two-station method. We also calculate cross-correlations of ambient noise between selected pairs of stations and we determine the corresponding group velocity dispersion curves. We propose a comparison of phase velocities between two stations measured from earthquakes with group velocities obtained from cross-correlations for the same station pairs. We also compare group velocities measured at single station using earthquakes, which occurred along the swath, with group velocities measured from cross-correlations. That way we analyze velocities of both deterministic and ambient noise reconstructed surface waves propagating along the same path. We invert the resulting dispersion curves for 1D shear wave velocity profiles with depth and we compile a quasi-2D velocity model along the EASI swath.